

features. The stele presents 6 "stages" of development, differing in the number and arrangement of the bundles; while 5 kinds of endodermis are recognized. An interesting series of facts is recorded in reference to the "adaptation of some leaves for a double life," and also their "adaptation for different levels of water." Another adaptation explained is the "arrangements in stems and leaves for the purpose of resisting the impetus of the waves and the current of water," 6 kinds of stem structure being recognized. All of these anatomical variations are not merely observed, but are arranged in evolutionary sequence. Numerous hybrids are recognized by means of the new characters used, as well as by sterile pollen grains and "deformed stigmata." In general, hybrids are very sterile, but sometimes sterility was found to occur also in "genuine species." The 138 species, 37 of which are described as new, and the 62 recognized hybrids are grouped in 26 sections. When it is remembered that *Potamogeton* has been credited heretofore with approximately 65 species, this increase to 200 species and hybrids indicates that it is a much more complex assemblage of forms than has been supposed. In general, the species and hybrids are described in great detail, not only including the ordinary taxonomic characters, but also their anatomy and "biology." In short, the monograph treats of the taxonomy, morphology, anatomy, and ecology of *Potamogeton*.—J. M. C.

Pennsylvania trees.—One of the best of the recent tree manuals issued by various states comes from Pennsylvania.¹⁹ It consists of two parts, the first devoted to an elementary discussion of the principles of forestry, the second consisting of an illustrated manual of the trees of the state. Among the topics treated in an interesting manner are the character of forest stands, their natural and artificial reproduction, the form and structure of trees, including a large number of photographic studies of bark, types and structure of twigs, buds, leaves, flowers, and fruit, and the structure of the wood. In the second part the keys and descriptions appear to be adequate and the illustrations decidedly superior to those usually seen. An entire page is devoted to each species, and the drawings include, in addition to the usual leaves and fruit, careful sketches of the flowers, buds, and leaf scars. The term "tree" is so broadly interpreted as to include such woody plants as *Rhus copallina*, *Acer spicatum*, and *Kalmia latifolia*.—GEO. D. FULLER.

Addisonia.—The fourth number of this finely illustrated journal contains colored plates and popular descriptions of *Sedum diversifolium*, *S. humifusum*, *Catasetum Scurra*, *Chionodoxa Luciliae gigantea*, *Agave subsimplex*, *Dasystephana Porphyrio*, *Cymophyllus Fraseri*, *Rhus hirta dissecta*, *Opuntia vulgaris*, *Tillandsia sublaxa*, and *Echeveria australis*.—J. M. C.

¹⁹ ILLICK, J. S., Pennsylvania trees. Pa. Dept. Forestry Bull. 11. pp. 232. pls. 129. figs. 109. 1915.